

Numbers and Operations  
Lesson 2: Powers, Roots, and  
Scientific Notation  
Math for Standards

Name \_\_\_\_\_

Date \_\_\_\_\_

Key Concepts:  
 $x^n$  stands for

$$x^m \bullet x^n =$$

$$\left(\frac{b^m}{b^n}\right) =$$

$$x^0 =$$

$$x^{-m} =$$

$$(x^m)^n =$$

$$\left(\frac{a}{b}\right)^m =$$

$$t^1 =$$

A **perfect square integer** is a number that you can take the \_\_\_\_\_  
of and have an integer as the solution.

**Scientific notation:** Will be a number larger than \_\_\_\_\_ and smaller than \_\_\_\_\_, and it  
will be multiplied by \_\_\_\_\_ raised to a \_\_\_\_\_.

Example 1: Matt Mitarnowski's farm has 200 calculator plants. He predicts that if he continues planting and buying new land, his crop will double every 7 years for the next 35 years, when he will either retire or sell his farm. If he is correct, how many calculator plants will he have 35 years from now?

Example 2: Simplify.

a.  $3^3 \bullet 3^6$

b.  $x^4 \bullet x^7$

c.  $b^8 \div b^5$

d.  $c^{-6} \bullet c^6$

Example 3: The population of a maggot colony quadruples every 3 days. If the population is 600 now, how many maggots will there be in 3 weeks?

Example 4: The area of a square is  $324 \text{ ft}^2$ . If the length of the side of the square is lengthened by 3 ft, what is the effect on the area of the square?

Example 5: The dwarf planet Pluto is approximately 5,913,520,000 km from the Sun. Write this in scientific notation.

Example 6: Particle Man weighs .0000000075 kg. Write his weight in scientific notation.

Example 7: Saturn has a diameter of  $7.4898 \bullet 10^4$  miles. Pluto has a diameter of  $1.423 \bullet 10^3$  miles.

a. What is the difference in their diameters, written in scientific notation?

b. How many times larger is the diameter of Saturn over Pluto?